

## 程式 60 Direct and indirect BEMs

In the BEM book of Chen&Hong, the BEPO2D program can give us

$$T_{ij}u_j = U_{ij}t_j$$

$$M_{ij}u = L_{ij}t_j$$

by using the direct BEM.

(a) Use the program or by hand calculation to find the potential  $u(0.5,0.5)$  for the example in P.17 as shown in the figure.

(b) Extend the direct BEM to the indirect BEM, we have

$$\begin{aligned} u_i &= \bar{U}_{ij}\tilde{f}_j & \text{or} & & u_i &= \bar{T}_{ij}\tilde{y}_j \\ t_i &= \bar{L}_{ij}\tilde{f}_j & & & t_i &= \bar{M}_{ij}\tilde{y}_j \end{aligned}$$

find  $\tilde{f}$  and  $\tilde{y}$ . According to  $\tilde{f}$  and  $\tilde{y}$ , determine the boundary flux normal  $\tilde{t}$  and compare with those derived by using the direct BEM.

(c) Find  $u(0.5,0.5)$  using the indirect method (single (UL) and double (TM)-layer approaches) and compare with those using the direct BEM (singular (UL) and hypersingular (TM) formulations).

